BTEC Assignment Brief

Qualification	Pearson BTEC National Level 3 Diploma in Engineering Pearson BTEC National Level 3 Diploma in Digital Engineering Pearson BTEC National Level 3 Diploma in Manufacturing Engineering Pearson BTEC National Level 3 Extended Diploma in Engineering Pearson BTEC National Level 3 Extended Diploma in Computer Engineering Pearson BTEC National Level 3 Extended Diploma in Manufacturing Engineering Pearson BTEC National Level 3 Extended Diploma in Mechanical Engineering
Unit number and title	**Unit 40: Computer Aided Manufacture and Planning**
Learning aim(s)	**B:** Develop a virtual component on a computer aided manufacturing system that simulates its manufacture
Assignment title	Prototyping a component
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You have been employed as an apprentice engineer at a small engineering firm producing bespoke components using computer aided manufacturing. Your managers were impressed with your technical report into CAM within the organisation and would like you to take ownership of the development of a bespoke component for a customer.

Task 1	Develop a drawing on a CAD system suitable for manufacturing and optimise and simulate the manufacturing of a component using a CAM systems. The customer's specifications are for a [custom bolt with a screw thread 44mm in diameter with a socket of their own design] to fit a custom tool they will provide. Model the component using a CAD system, and demonstrate the use of 3D drawing commands such as lines, arcs, extrude and revolve, and the use of 2D drawing commands such as erase, trim, move and copy. Utilise a CAD to CAM file transfer system using an appropriate format in order to execute the design within a CAM system. Simulate and refine the manufacture of the component and set up the parameters of the CAM system, including tool paths, changes and sizes, cycle times, roughing and finishing cycles, and the reduction of waste. You should also demonstrate graphical simulation, tool collision detection and tool paths.

	Perform quality control checks on the virtual component to assess its suitability for the customer and the specification and demonstrate safe manufacturing on a CAM system.
Checklist of evidence required	The evidence should include, CAD drawings, CAM program, screenshots of the processes, and inspection documentation.

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria you must show that you are able to:
40/B.D2	Optimise, using a CAM system, the virtual manufacture of a realistic graphical component safely and efficiently, while correcting any errors and ensuring the component conforms to the specification.
40/B.M2	Simulate, using a CAM system, the virtual manufacture of a realistic graphical component safely, while correcting any errors and ensuring the component conforms to the specification.
40/B.P3	Create a realistic graphical model of a component, suitable for manufacture using a CAM system.
40/B.P4	Simulate, using a CAM system, the virtual manufacture of a component safely.